U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER
TRANMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		YAM 1
		U S APPLICATION NO. (If known,see 37 CFR 1.5) 09/830357
INTERNATIONAL APPLICATION NO. PCT/IL99/00564	INTERNATIONAL FILING DATE 25 October 1999	PRIORITY CLAIMED 25 October 1998
TITLE OF INVENTION PREPARATION AND USE OF SOLIDIFIED OILS		
APPLICANT(S) FOR DO/EO/US **Daniel YAM**		

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [X] The US has been elected in a Demand by the expiration of 19 months from the priority date (PCT Article 31).
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is attached hereto (required only if not transmitted by the International Bureau).
   b. [X] has been communicated by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [ ] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
7. [X] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been communicated by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [X] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An Assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [X] Other items or information:
    [X] Courtesy copy of the International Application as filed.
    [X] Courtesy copy of the first page of the International Publication (WO 00/24360).
    [X] Formal drawings, 1 sheet, Figure 1-1.
    [X] Courtesy Copy of the International Search Report.

U.S. APPLICATION NO. (If known,see 37 CFR 1.5)	International Application No.	Attorney's Docket No.
09/830357	PCT/IL99/00564	YAM 1

17. [xx] The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a)(1) –(5):

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.....**$1000.00**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....**$860.00**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....**$710.00**

International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4).....**$690.00**

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4).....**$100.00**

	CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 690.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [X] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 130.00	

Claims as Originally Presented	Number Filed	Number Extra	Rate		
Total Claims	1 - 20		X $18.00	$	
Independent Claims	1 - 3		X $80.00	$	
Multiple Dependent Claims (if applicable)			+$270.00	$	
TOTAL OF ABOVE CALCULATIONS =				$ 820.00	
Claims After Post Filing Prel. Amend	Number Filed	Number Extra	Rate		
Total Claims	41 - 20	21	X $18.00	$ 378.00	
Independent Claims	4 - 3	1	X $78.00	$ 80.00	
TOTAL OF ABOVE CALCULATIONS =				$ 1,278.00	

Reduction of ½ for filing by small entity, if applicable. Applicant claims small entity status. See 37 CFR 1.27.	$	
SUBTOTAL =	$ 1,278.00	
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	$	
TOTAL NATIONAL FEE =	$ 1,278.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	$	
TOTAL FEES ENCLOSED =	$ 1,278.00	
	Amount to be: refunded	$
	charged	$

a. [ ] A check in the amount of $_____ to cover the above fees is enclosed.

b. [X] Credit Card Payment Form (PTO-2038), authorizing payment in the amount of $1,278.00, is attached.

c. [ ] Please charge my Deposit Account No. **02-4035** in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

d. [XX] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **02-4035**. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, N.W., SUITE 300
WASHINGTON, D.C. 20001
TEL: (202) 628-5197
FAX: (202) 737-3528

Date of this submission: **April 25, 2001**

SIGNATURE

Sheridan Neimark
NAME

20,520
REGISTRATION NUMBER

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Daniel YAM	)	Art Unit:
IA No.: PCT/IL99/00564	)	Washington, D.C.
IA Filed: 25 October 1999	)	
U.S. App. No.: (Not Yet Assigned)	)	April 25, 2001
National Filing Date: (Not Yet Received)	)	
For: PREPARATION AND USE OF…	)	Docket No.: YAM 1

PRELIMINARY AMENDMENT

Honorable Commissioner for Patents and Trademarks
Washington, D.C. 20231

Sir:

Contemporaneous with the filing of this case and prior to calculation of the filing fee, kindly amend as follows:

IN THE SPECIFICATION

After the title please insert the following paragraph:

--**REFERENCE TO RELATED APPLICATIONS**

The present application is the national stage under 35 U.S.C. 371 of international application PCT/IL99/00564, filed 25 October 1999 which designated the United States, and which international application was published under PCT Article 21(2) in the English language.--

IN THE CLAIMS

Please cancel claims 2-60.

REMARKS

The above amendment to the specification is being made to insert reference to the PCT application of which the present case is a U.S. national stage. The above amendment to the claims is being made to better comply with U.S. practice and to reduce the filing fee.

Favorable consideration is earnestly solicited.

Respectfully submitted,
BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant

By: ______________________
Sheridan Neimark
Registration No. 20,520

SN:edg
Telephone No.: (202) 628-5197
Facsimile No.: (202) 737-3528
F:\,W\Webb\Yam 1\PTO\Pre. Amendment.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Daniel YAM	)	Art Unit:
IA No.: PCT/IL99/00564	)	Washington, D.C.
IA Filed: 25 October 1999	)	
U.S. App. No.: (Not Yet Assigned)	)	April 25, 2001
National Filing Date: (Not Yet Received)	)	
For: PREPARATION AND USE OF…	)	Docket No.: YAM 1

SUPPLEMENTAL PRELIMINARY AMENDMENT

Honorable Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination upon the merits, kindly amend as follows:

IN THE CLAIMS

Please cancel claim 1 and insert the following new claims:

--61. A composition of matter that is semi-solid or solid at room temperature and/or when refrigerated by household means, comprising a mixture of at least about 50% or more by weight of at least one liquid oil and 50% or less of at least one solid fat, wherein said at least one liquid oil

is a liquid in at least one portion of the temperature range of 4-25°C and said at least one solid fat is a solid in at least one portion of the temperature range of 4-25°C.

--62. A composition of matter according to claim 61, wherein said at least one liquid oil contains omega-3 polyunsaturated fatty acids (Ω-3 PUFA).

--63. A composition of matter according to claim 62, wherein said at least one liquid oil in the solidified mixture contains from about 20% to about 90% by weight of omega-3 polyunsaturated fatty acids.

--64. A composition of matter according to claim 63, wherein said at least one liquid oil containing omega-3 polyunsaturated fatty acids is fish oil.

--65. A composition of matter according to claim 64, wherein said fish oil contains about 60% by weight of omega-3 polyunsaturated fatty acids.

--66. A composition of matter according to claim 61, wherein said at least one liquid oil is a vegetable oil.

--67. A composition of matter according to claim 66, wherein said at least one vegetable oil is selected from soybean oil and olive oil.

--68. A composition of matter according to claim 61, wherein said at least one solid fat is selected from a group of solid fats consisting of beeswax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, and lanolin.

--69. A composition of matter according to claim 68, wherein said at least one solid fat is an artificially hydrogenated vegetable oil selected from a group of vegetable oils consisting of soybean oil, rapeseed oil, olive oil, cottonseed oil, walnut oil, peanut oil, and almond oil.

--70. A composition of matter according to claim 61, wherein said at least one liquid oil is fish oil and said at least one solid fat is beeswax.

--71. A composition of matter according to claim 70, comprising from about 50% to about 80% of by weight of fish oil.

--72. A composition of matter according to claim 70, comprising at least about 80% by weight of fish oil.

--73. A composition of matter according to claim 72, comprising about 60% by weight of omega-3 polyunsaturated fatty acids.

--74. A composition of matter according to claim 61, wherein said at least one liquid oil is a vegetable oil and said at least one solid fat is beeswax.

--75. A composition of matter according to claim 74, wherein said vegetable oil is soybean oil.

--76. A composition of matter according to claim 74, wherein said vegetable oil is olive oil.

--77. A composition of matter according to claim 61, wherein the composition has a homogeneous consistency.

--78. A composition of matter according to claim 77, in the form of a homogeneous semi-solid spreading paste.

--79. A composition of matter according to claim 61, further comprising at least one additional ingredient.

--80. A composition of matter according to claim 79, wherein said at least one additional ingredient is at least one flavoring agent.

--81. A composition of matter according to claim 80, wherein said at least one flavoring agent is smoked salmon flavor or parmesan cheese flavor.

--82. A composition of matter according to claim 79, wherein said at least one additional ingredient is at least one odorant.

--83. A composition of matter according to claim 82, wherein said at least one odorant is garlic scent or oregano scent.

--84. A homogeneous semi-solid paste suitable for spreading comprising at least about 50% by weight of fish oil and about 50% or less of beeswax.

--85. A homogeneous semi-solid paste suitable for spreading according to claim 84 comprising at least about 80% by weight of fish oil.

--86. A homogeneous semi-solid paste suitable for spreading according to claim 85 comprising about 60% by weight of omega-3 polyunsaturated acids.

--87. A homogeneous semi-solid paste suitable for spreading according to claim 85, further comprising at least one additional ingredient.

--88. A homogeneous semi-solid paste suitable for spreading according to claim 87, wherein said at least one additional ingredient is selected from at least one odorant and at least one flavoring agent.

--89. A method for the preparation of a composition of matter according to claim 61, the method comprising the steps of:

(a) heating a mixture of said at least one liquid oil and said at least one solid fat to a temperature above the melting point of said at least one solid fat, under conditions such that homogeneous consistency is obtained; and

(b) gradually cooling said mixture to room temperature, thus obtaining a homogeneous semi-solid or solid paste that can be stored at room temperature and/or by refrigeration by household means.

--90. A method according to claim 89 for the preparation of a homogeneous semi-solid paste suitable for spreading comprising from about at least 50% to about at least 80% by weight of fish oil and about 20% to about 50% of beeswax, said method comprising the steps of:

(a) mixing fish oil with beeswax at 80 °C under stirring until a homogeneous consistency is obtained; and

(b) cooling said mixture to room temperature, thus obtaining a homogeneous semi-solid or solid paste containing from at least about 50% to about at least 80% by weight of fish oil, that can be stored at room temperature and/or by refrigeration by household means.

--91. A method according to claim 90, for the preparation of a homogeneous semi-solid paste suitable for spreading comprising about 83% by weight of fish oil, said method comprising the steps of:

(a) mixing 400 g fish oil with 80 g beeswax at 80 °C under stirring until a homogeneous consistency is obtained; and

(b) cooling said mixture to room temperature, thus obtaining a homogeneous semi-solid or solid paste containing about 83% by weight of fish oil that can be stored at room temperature and/or by refrigeration by household means.

--92. A homogeneous semi-solid paste suitable for spreading comprising from about at least 50% to about at least 80% by weight of fish oil and from bout 20% to about 50% of beeswax, said homogeneous semi-solid paste being formed by a method comprising the steps of:

(a) mixing fish oil with beeswax at 80°C under stirring until a homogeneous consistency is obtained; and

(b) cooling said mixture to room temperature, thus obtaining said homogeneous semi-solid paste suitable for spreading.

--93. A method of increasing patient compliance in therapy regimens requiring consumption of liquid oils as dietary supplements, said method comprising administration to said patient of a composition of matter that is semi-solid or solid at room temperature and/or when refrigerated by household means, comprising a mixture of at least about 50% or more by weight of at least one liquid oil and 50% or less of at least one solid fat, wherein said at least one liquid oil is a liquid in at least one portion of the temperature range of 4-25°C and said at least one solid fat is a solid in at least one portion of the temperature range of 4-25°C.

--94. A method according to claim 93, wherein said at least one liquid oil contains omega-3 polyunsaturated fatty acids.

--95. A method according to claim 94, wherein said composition is in the form of a homogeneous semi-solid paste comprising fish oil and beeswax.

--96. A method according to claim 93, for prevention or treatment of a medical condition selected from the group consisting of cancer, hyperlipidemia, hypertriglyceridemia, hypo HDL, high cholesterol, hyperinsulinemia and hyperglycemia.

--97. A nutritional supplement comprising a composition according to claim 61.

--98. A food additive comprising a composition according to claim 61.

--99. A food additive according to claim 98 wherein said composition is a omega-3 polyunsaturated fatty acid enriched composition.

--100. A food additive according to claim 99 wherein said composition comprises omega-3 polyunsaturated fatty acid enriched fish oil.

--101. A cosmetic preparation comprising a composition according to claim 61.--

REMARKS

Claims 61-101 presently appear in this case. The above amendments to the claims are being made in order to place the claims in to better to condition for examination. Favorable consideration is earnestly solicited.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant

By: _____
Sheridan Neimark
Registration No. 20,520

SN:edg
Telephone No.: (202) 628-5197
Facsimile No.: (202) 737-3528
F:\,W\Webb\Yam 1\PTO\Sup. Pre. Amendment.doc

PREPARATION AND USE OF SOLIDIFIED OILS

FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to a method of solidifying at least one oil by the addition of at least one solid fat and, more particularly, to a method of forming a semi-sold paste containing a high concentration of an oil which is normally liquid. The present invention further relates to a soft solid mixture which typically includes 50 % or more ethyl esters of natural fatty acids and 50 % or less solid fat and, more particularly, to a semi-solid mixture containing fish oil or another source of fat soluble vitamins, including, but not limited to, purified vitamin E. The present invention further relates to a method of using an oil for purposes including, but not limited to, nutritional supplementation, cosmetic treatment, and medical treatment.

Most fats which are nutritionally important substances exist as fluid oils. Their handling, storage and application is therefore limited to containers (e.g., cooking oil) or capsules (e.g., vitamin E). In principle, such oils can be handled in a solidified form by the addition of large excess of solids like starch, calcium carbonate, lactose etc., which is a common practice in the pharmaceutical industry. After addition of solids, the oils may be pressed into tablets. Owing to the physical size limit of tablets or capsules designed to be consumed by humans, high dose therapy with purified vitamin E, or with substances such as wheat germ oil or fish oil has been problematic because treatment regimens require daily consumption of tens of tablets or capsules. Much of the problem stems not from the efficacy of the therapeutic oil, but from poor patient compliance with treatment protocols requiring intake of large numbers of tablets or capsules each day. The root of this compliance problem lies in the fact that preparation of soft-solid mixtures which contain dietary oil at a concentration above 50 % while the solidifying agent is biologically compatible, are not taught by prior art.

There is increasing evidence that vitamin E, or fish oil which is rich in omega-3 polyunsaturated fatty acids (Ω-3 PUFA), can be used advantageously to treat or prevent a wide range of conditions including, but not limited to, excess gastric acid secretion, blood clotting, arterial thrombogenesis, various types of cancer, hepatitis, depression, high blood pressure, and heart disease (Riber, C. et al., Scand. J. Gastroenterol. (1999) 34:845-8; Saldeen, T. et al., J. Am. Coll. Cardiol. (1999) 34:1208-15; Ferguson, L.R. Mutat. Res. (1999) 428:329-38; Look, M.P. et al., Antiviral Res. (1999) 43:113-22; Kolleck, I. et al. Free Radic. Biol. Med. (1999) 27:882-90; Shibata, H. et al., J. Epidemiol. (1999) 9:261-7; Cham, B.E. et al., Clin. Chim. Acta. (1999) 287:45-57; Yosefy, C. et al., Prostaglandins Leukot Essent Fatty Acids (1999) 61:83-7; Hardman, W.E. et al. Br. J. Cancer (1999) 81:440-8; Barber, M.D. B.M.J. (1999) 319(7203):187; Adams, A.K. et al., Am. Fam. Physician (1999) 60:895-904; Barber, M.D. et al., Br. J. Cancer (1999) 81:80-6; Latham, P. et al. Biochem. Soc. Trans. (1998) 26:S158; Bang, H.O. Compr. Ther. (1990) 16:31-5; Urakaze, M. et al. J. Hum. Hypertens. (1989) 3:277-8)

Unfortunately, many patients suffering from diseases which may be treated by nutritionally important oils suffer from nausea and reduced appetite. These patients are especially unlikely to comply with treatment protocols which include ingestion of large numbers of pills or tablets each day.

There is thus a widely recognized need for, and it would be highly advantageous to have, nutritionally or medically important oils at high concentration in a semi-solid form in order to facilitate better patient compliance with proposed treatment regimens.

SUMMARY OF THE INVENTION

According to one aspect of the present invention there is provided a method of solidifying liquid oils, the method comprising the steps of (a) mixing at least one liquid oil and at least one solid fat, thereby forming a mixture of the at least one liquid oil and the at least one solid fat; and (b) transforming the mixture into a homogeneous consistency.

According to another aspect of the present invention there is provided a composition of matter comprising a mixture of at least one liquid oil and at least one solid fat.

According to yet another aspect of the present invention there is provided a composition of matter comprising a mixture of at least one ethyl ester of a natural fatty acid and at least one solid fat.

According to still another aspect of the present invention there is provided a method of using at least one liquid oil for a purpose selected from the group consisting of nutritional supplementation, cosmetic treatment, use as a food additive, medical treatment, medical prophylaxis and cosmetic prophylaxis, the method comprising the steps of using a composition of matter including a mixture of at least one liquid oil and at least one solid fat for accomplishing the purpose.

According to an additional aspect of the present invention there is provided a method of using at least one liquid oil for prevention or treatment of a medical condition selected from the group consisting of cancer, hypertriglyceridemia, hypo HDL, high cholesterol, hyperinsulinemia and hyperglycemia, the method comprising the step of using a composition of matter including a mixture of at least one liquid oil and at least one solid fat for accomplishing the prevention or treatment.

According to further features in preferred embodiments of the invention described below, the composition of matter has a homogeneous consistency.

According to still further features in the described preferred embodiments the at least one liquid oil is at least 50 % of the mixture by weight.

According to still further features in the described preferred embodiments the composition of matter further comprising at least one additional ingredient.

According to still further features in the described preferred embodiments the at least one additional ingredient includes at least one flavoring agent.

According to still further features in the described preferred embodiments the at least one additional ingredient includes at least one odorant.

According to still further features in the described preferred embodiments the at least one solid fat is selected from a group of solid fats consisting of bee wax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, rendered animal fat and lanolin.

According to still further features in the described preferred embodiments the at least one solid fat is a synthetic polyester of fatty acids and a saccharide.

According to still further features in the described preferred embodiments the saccharide is selected from the group of saccharides consisting of sorbitol, glucose, fructose, lactose, mannose, ribose and deoxy-ribose.

According to still further features in the described preferred embodiments the at least one solid fat is a mixture of saccharide is sucrose

and further wherein the fatty acid is selected from the group consisting of polypalmitate and polystearate.

According to still further features in the described preferred embodiments the at least one liquid oil includes omega-3 polyunsaturated fatty acids.

According to still further features in the described preferred embodiments the at least one liquid oil includes α–tocopherol (vitamin E).

The present invention successfully addresses the shortcomings of the presently known configurations by providing nutritionally or medically important liquid oils at high concentration in a semi-solid form in order to facilitate better patient compliance with proposed treatment regimens.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawings. With specific reference now to the drawings in detail, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of the preferred embodiments of the present invention only, and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the invention. In this regard, no attempt is made to show structural details of the invention in more detail than is necessary for a fundamental understanding of the invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the invention may be embodied in practice.

In the drawings:

FIG. 1 is a bar-graph presenting the effect of consuming a bee wax solidified fish oil containing 60 % Ω-3 PUFA according to the present invention on lung metastasis. Mice (C57BL/6J) were kept in filter-covered plastic cages (10 mice per cage) and were fed ad libitum with a basal oil-free

standard diet supplemented with 5 % by weight of either bee wax solidified fish oil (FO) or bee wax solidified soybean oil (SO). After two weeks mice were inoculated in the footpad with 5 x 10^5 cells of a highly metastatic clone (D 122) of the 3LL Lewis Lung Carcinoma cell line (Eisenbach, L. et al. Int. J. Cancer (1993) 32:113-120) per mouse in 50 µl sterile phosphate buffered saline (PBS). When primary tumor reached a diameter of 8-9 mm, as was determined using a Varnier caliber, the tumor bearing leg was removed by amputation after ligation above the knee joint. Twenty eight days after amputation the surviving mice were sacrificed and lungs were assessed for metastatic load by weighing.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is of methods for producing mixtures containing typically greater than 50 % liquid oil(s) which are semi-solid or solid at room temperature and/or when refrigerated by household means. The present invention is further of compositions of matter containing typically greater than 50 % liquid oil which are semi-solid or solid at room temperature and/or when refrigerated by household means. The present invention is further of methods of medical treatment, prophylaxis, nutritional supplementation or cosmetic treatment which employ compositions of matter containing greater than 50 % oil which are semi-solid or solid at room temperature and/or when refrigerated by household means. Specifically, the present invention can be used to increase patient compliance in therapy regimens requiring consumption of large quantities of oil by allowing preparation and presentation of the material to be ingested in a small volume and in a more palatable form than previously available.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of the components set forth in the

following description or illustrated in the drawings. The invention is capable of other embodiments or of being practiced or carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein is for the purpose of description and should not be regarded as limiting.

For purposes of this specification and the accompanying claims, the term "liquid oil" refers to an oil which is a liquid in at least a portion of the temperature range of 4-25 °C.

For purposes of this specification and the accompanying claims, the term "solid fat" refers to an oil which is a solid in at least a portion of the temperature range of 4-25 °C

For purposes of this specification and the accompanying claims, the term "vegetable oil" refers to any oil derived from any part of a plant, including, but not limited to, soybean oil, corn oil, rapeseed oil, olive oil, yam oil, cottonseed oil, walnut oil, peanut oil and almond oil.

For purposes of this specification and the accompanying claims, the term "artificially hydrogenated" refers to any process by which the degree of saturation of carbon to carbon double bonds may be increased, whether mechanically, physically, or chemically.

As shown in Example 1 below, one preferred embodiment of the present invention is solidification of fish oil by bee wax to produce a mixture containing about 80 % Ω-3 PUFA. A patient requiring a daily dose of 6 grams of Ω-3 PUFA would therefore need to consume 10-12 grams of the resultant semi-solid paste. This portion of semi-solid paste would take the place of, for example, 20 capsules which typically contain about 300 mg Ω-3 PUFA.

A 10-12 gram portion of solidified fish oil paste could be ingested, for example, by spreading it upon a single slice of bread. According to alternate

embodiments, the semi-solid paste might be mixed with flavoring agents, including, but not limited to, smoked salmon flavor, or parmesan cheese flavor, to render it more palatable. Alternately, odorants, such as garlic scent or oregano scent might be added to increase palatability.

As shown in Example 4 below, purified vitamin E may be similarly solidified by combining it with a low calorie fat substitute. Advantages of using a low calorie fat substitute in compositions of matter of the present invention include, but are not limited to, keeping total caloric intake of a patient as low as possible.

Myriad medical conditions may be treated using oils as dietary supplements. Examples 5 and 6 describe treatment of a cancer (in an animal model) and hyperlipidemia, respectively. These embodiments are presented as examples of a wide range of possible benefits from the present invention.

Example 5 describes reduced tumor growth, mortality and metastatic growth in a well established murine lung cancer model in response to dietary supplementation with solidified fish oil prepared according to the method of the present invention. Extrapolation of the results to human patients suggests tremendous potential benefit. With respect to cancer patients, the method of the present invention is especially important, since these patients tend to suffer from decreased appetite and nausea. It is therefore especially important to increase palatability of medication in order to elicit compliance with a proposed treatment regimen.

Example 6 describes the effects of administration of solidified fish oil according to the present invention to human subjects to control hyperlipidemia. After 6 weeks, treatment induced a significant reduction in triglycerides, cholesterol, insulin and glucose was observed. A concurrent increase in HDL and decrease in cholesterol values was achieved. Since this type of treatment must be on going in order to be medically effective, issues

of patient compliance in the long run are critical. Increasing palatability of a medicine, or presenting together with food, are important in this context too.

Thus, according to one aspect of the present invention there is provided a method of solidifying liquid oils. The method according to this aspect of the present invention is effected by mixing at least one liquid oil and at least one solid fat, thereby forming a mixture of same and further by transforming the mixture into a homogeneous consistency.

According to another aspect of the present invention there is provided a composition of matter which includes a mixture of at least one liquid oil and at least one solid fat.

According to yet another aspect of the present invention there is provided a composition of matter which includes a mixture of at least one ethyl ester of a natural fatty acid (which is a liquid oil) and at least one solid fat.

According to still another aspect of the present invention there is provided a method of using at least one liquid oil for a purpose, such as, but not limited to, nutritional supplementation, cosmetic treatment, use as a food additive, medical treatment, medical prophylaxis and/or cosmetic prophylaxis. The method according to this aspect of the present invention is effected by using a composition of matter including a mixture of at least one liquid oil and at least one solid fat for accomplishing the purpose. The use may include, but is not limited to, ingestion and/or external application.

According to an additional aspect of the present invention there is provided a method of using at least one liquid oil for prevention or treatment of a medical condition such as, but not limited to, cancer, hypertriglyceridemia, hypo HDL, high cholesterol, hyperinsulinemia and/or hyperglycemia. The method according to this aspect of the present invention is effected by using a composition of matter including a mixture of at least

one liquid oil and at least one solid fat for accomplishing the prevention or treatment. The use may include, but is not limited to, ingestion and/or external application.

According to a preferred embodiment of the present invention the composition of matter has a homogeneous consistency. Such homogeneous consistency can be achieved by, for example, heating the mixture of oil and fat to a temperature above the melting temperature of the fat, e.g., 40-100 °C, and thereafter gradually cooling the mixture to room temperature.

According to preferred embodiments of the present invention the liquid oil(s), which is the constituent of therapeutic value, is at least 50 %, preferably at least 60 %, more preferably, at least 70 %, most preferably at least 80 % of the solidified mixture by weight. It will however be appreciated that sufficient percentage of fat(s) should be employed to achieve solidification at at least a portion of the temperature range of 4 °C and 25 °C.

The composition of matter according to preferred embodiments of the present invention preferably includes in addition to oil(s) and fat(s) at least one additional ingredient, such as but not limited to, at least one flavoring agent and/or at least one odorant. Extracts of such flavoring agents and odorants are well known in the art. Such agents or odorants come in many forms ranging from powders to liquid extracts. They are typically used in minute quantities, typically fractions of percents up to a few percents by weight, to alter a taste and/or the odor of foods.

The solid fat(s) can be on any type which complies with the above definition, such as, but not limited to bee wax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, rendered animal fat and/or lanolin. Alternatively or in addition the solid fat can include a synthetic polyester of fatty acids and a saccharide, such as, but not limited to, sorbitol, glucose, fructose, lactose, mannose, ribose or deoxy-ribose. The fatty acid is

preferably polypalmitate and polystearate, whereas the saccharide is preferably sucrose.

The liquid oil(s) fraction of the solidified mixture according to the present invention preferably includes substantial amounts, say 20-90 % by weight, of omega-3 polyunsaturated fatty acids. Thus, the liquid oil employed can be omega-3 polyunsaturated fatty acids enriched fish oil, e.g., above 50 %, preferably about 80 % by weight omega-3 polyunsaturated fatty acids. Thus, the liquid oil employed can be Ω-3 PUFA enriched fish oil.

Alternatively, the liquid oil(s) fraction of the solidified mixture according to the present invention preferably includes substantial amounts, say 20-90 % by weight, of α–tocopherol (vitamin E).

Additional objects, advantages, and novel features of the present invention will become apparent to one ordinarily skilled in the art upon examination of the following examples, which are not intended to be limiting. Additionally, each of the various embodiments and aspects of the present invention as delineated hereinabove and as claimed in the claims section below finds experimental support in the following examples.

EXAMPLES

Reference is now made to the following examples, which together with the above descriptions, illustrate the invention in a non-limiting fashion.

Generally, the nomenclature used herein and the laboratory procedures in described below are those well known and commonly employed in the art. Other general references are provided throughout this document. The procedures therein are believed to be well known in the art and are provided for the convenience of the reader. All the information contained therein is incorporated herein by reference.

Example 1

Solidification of fish oil by bee wax

Eighty grams of bee wax (Colmeia do Mato Grosso, Mato Grosso, Brasil) was warmed to 80 °C and mixed, under a nitrogen atmosphere with 400 grams fish oil (EPAX7010 triglycerides, Pronova Biocare a.s. Sandefjord, Norway). The mixture was mechanically stirred until a homogeneous consistency was obtained. Upon cooling to 25 °C, the mixture solidified to form a homogeneous semi-solid paste. The weight percent of the fish oil in this mixture is 83 %. This material was subsequently employed in Examples 5 and 6.

Example 2

Solidification of soybean oil by bee wax

Eighty grams of bee wax (Colmeia do Mato Grosso, Mato Grosso, Brasil) was warmed to 80 °C and mixed, under a nitrogen atmosphere with 400 grams soybean oil (from the market). The mixture was mechanically stirred until a homogeneous consistency was obtained. Upon cooling to 25 °C, the mixture solidified to form a homogeneous semi-solid paste. The weight percent of the oil in this mixture is 80 %. This material was subsequently employed as control in Example 5.

Example 3

Solidification of soybean oil by bee wax

Eighty grams of bee wax (Colmeia do Mato Grosso, Mato Grosso, Brasil) was warmed to 80 °C and mixed, under a nitrogen atmosphere with 400 grams olive oil (from the market). The mixture was mechanically stirred until a homogeneous consistency was obtained. Upon cooling to 25 °C, the mixture solidified to form a homogeneous semi-solid paste. The weight

percent of the oil in this mixture is 80 %. This material was subsequently employed as control in Example 6.

Example 4

Solidification of α-tocopherol (vitamin E) by sucrose polyester

Ten grams of α-tocopherol (vitamin E, Sigma, St. Louis, Missouri) was mixed with 2 grams sucrose polyester (Olestra; Procter and Gamble, Mason, Ohio) and warmed to 80 °C under a nitrogen atmosphere to produce a homogenous mixture. Upon cooling to room temperature the mixture solidified. The weight percent of vitamin E in this mixture is 83 %.

Example 5

Treatment of tumor bearing mice with solidified fish oil

Using previously published methods for monitoring tumor progression and metastatic growth (Yam et al. Nutritional Bioch. (1979) 8:619-622) the effect of solidified fish oil prepared as is described under Example 1 on mice (C57BL/6J) bearing a well characterized Lewis Lung Carcinoma (3LL) was studied in comparison to control mice of the same strain and to mice (C57BL/6J) bearing the well characterized Lewis Lung Carcinoma (3LL) fed with solidified soybean oil as is described under Example 2

All mice were kept in filter-covered plastic cages (10 mice per cage) and were fed ad libitum with a basal oil-free standard diet supplemented with 5 % by weight of either bee wax solidified fish oil (FO) or bee wax solidified soybean oil (SO).

After two weeks of ad libitum feeding with these diets, tumor inoculation was conducted using a highly metastatic clone (D 122) of the 3LL Lewis Lung Carcinoma cell line (Eisenbach, L. et al. Int. J. Cancer (1993) 32:113-120). To this end, mice were inoculated in the footpad with 5 x 10^5 cells per mouse in 50 µl sterile phosphate buffered saline (PBS). Tumor size was monitored with a Varnier caliber. As described by

Eisenbach et al., when local tumor reached a diameter of 8-9 mm, the tumor bearing leg was removed by amputation after ligation above the knee joint. Twenty eight days after amputation the surviving mice were sacrificed and lungs were assessed for metastatic load by weighing and further by histological examination.

Significantly slower growth of primary tumor, lower mortality rate and lower metastatic spread were observed in mice fed with fish oil (FO) in comparison with mice fed with soybean oil (SO). The results of lung weights are summarized in Figure 1.

Example 6

Treatment of patients with hyperlipidemia with solidified fish oil

Patients and methods: 21 ambulatory patients, age 48-71 y (15 men and 6 women) with hyperlipidemia were divided in two groups (test and control groups), took part in this study. The test group (10 men and 2 women) consumed 5 grams per day of solidified fish oil in the form described under Example 1 above, while the control group (7 patients) consumed the same amount of an isocaloric placebo in which the fish oil was replaced by olive oil as described under Example 3 above. Fasting blood samples were drawn at 0 and 42 days for analysis (see table 1 below).

Blood analysis: Part of the blood was transferred to precooled centrifuge tubes containing fluoride-oxalate and centrifuged at 1,500 r.p.m. for 10 minutes and plasma was collected and frozen.

Triglycerides were determined by an enzymatic procedure with a commercial kit (Triglycerides Enzymatiques PAP 1000, Bio-Merieux, Charbonnieres-les-Bains, France).

Total cholesterol was determined in serum by an enzymatic colorimeter method according to Siedel et al. (Clin. Chem. (1983) 29:1075)

using a commercially available kit (Monotest Cholesterol, Bohringer Diagnostica, GmbH, Mannheim, FRG).

High-density lipoprotein (HDL) was analyzed according to Lopes-Virella et al. (Clin. Chim. (1977) 23:882).

Insulin level was determined in the serum by a double antibody radioimmunoassay, using ^{125}I-labeled human insulin (Pharmacia Diagnosis AB, Uppsala, Sweden).

Glucose was determined according to Pennock et al. (Clin. Chi. Acta. (1973) 48:193).

The results are summarized in Table 1 below.

Table 1

Values* of plasma triglycerides, cholesterol, LDL-cholesterol insulin and glucose at day 0 and after 42 days

	TEST GROUP		CONTROL GROUP	
	0 days	42 days	0 days	42 days
Triglycerides (mg/dl)	240±39	180±18	230±35	220±42
Cholesterol (mg/dl)	270±34	230± 19	280±36	260±28
HDL-cholesterol (mg/dl)	30±12	48±16	32±15	35±17
Insulin (μU/ml)	31±13	18±8	30±14	31±17
Glucose (mg/dl)	142±18	95±15	128±22	126±22

***Mean ± S.D.**

The results of the blood biochemistry presented in Table 1 above indicate that the solidified fish oil treatment induced a significant reduction in triglycerides, cholesterol, insulin and glucose and an increase in HDL-cholesterol values after 42 days of treatment. No significant changes were observed in the control group. No negative side effects were observed in either group.

Although the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations that fall within the spirit and broad scope of the appended claims.

WHAT IS CLAIMED IS:

1. A method of solidifying liquid oils, the method comprising the steps of:

(a) mixing at least one liquid oil and at least one solid fat thereby forming a mixture of said at least one liquid oil and said at least one solid fat; and

(b) transforming said mixture into a homogeneous consistency.

2. The method of claim 1, wherein said at least one liquid oil comprises at least 50 % by weight of said mixture.

3. The method of claim 1, wherein said step of transforming said mixture into said homogeneous consistency is effected by heating said mixture.

4. The method of claim 3, wherein heating said mixture is to a temperature between 45 °C and 100 °C.

5. The method of claim 3, further comprising the step of:

(c) cooling said mixture to room temperature while maintaining said homogeneous consistency.

6. The method of claim 1, wherein at least one additional ingredient is added to said mixture.

7. The method of claim 6, wherein said at least one additional ingredient includes at least one flavoring agent.

8. The method of claim 6, wherein said at least one additional ingredient includes at least one odorant.

9. The method of claim 1, wherein said at least one solid fat is selected from the group consisting of bee wax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, rendered animal fat and lanolin.

10. The method of claim 1, wherein said at least one solid fat is a synthetic polyester of fatty acids and a saccharide.

11. The method of claim 10, wherein said saccharide is selected from the group of saccharides consisting of sorbitol, glucose, fructose, lactose, mannose, ribose and deoxy-ribose.

12. The method of claim 10, wherein said at least one solid fat is a mixture of saccharide is sucrose and further wherein said fatty acid is selected from the group consisting of polypalmitate and polystearate.

13. The method of claim 1, wherein said at least one liquid oil includes omega-3 polyunsaturated fatty acids.

14. The method of claim 1, wherein said at least one liquid oil includes α-tocopherol (vitamin E).

15. A composition of matter comprising a mixture of at least one liquid oil and at least one solid fat.

16. The composition of matter of claim 15, wherein the composition of matter has a homogeneous consistency.

17. The composition of matter of claim 15, wherein said at least one liquid oil is at least 50 % of said mixture by weight.

18. The composition of matter of claim 15, further comprising at least one additional ingredient.

19. The composition of matter of claim 18, wherein said at least one additional ingredient includes at least one flavoring agent.

20. The composition of matter of claim 18, wherein said at least one additional ingredient includes at least one odorant.

21. The composition of matter of claim 15, wherein said at least one solid fat is selected from a group of solid fats consisting of bee wax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, rendered animal fat and lanolin.

22. The composition of matter of claim 15, wherein said at least one solid fat is a synthetic polyester of fatty acids and a saccharide.

23. The composition of matter of claim 22, wherein said saccharide is selected from said group of saccharides consisting of sorbitol, glucose, fructose, lactose, mannose, ribose and deoxy-ribose.

24. The composition of matter of claim 22, wherein said at least one solid fat is a mixture of saccharide is sucrose and further wherein said fatty acid is selected from said group consisting of polypalmitate and polystearate.

25. The composition of matter of claim 15, wherein said at least one liquid oil includes omega-3 polyunsaturated fatty acids.

26. The composition of matter of claim 15, wherein said at least one liquid oil includes α-tocopherol (vitamin E).

27. A composition of matter comprising a mixture of at least one ethyl ester of a natural fatty acid and at least one solid fat.

28. The composition of matter of claim 27, wherein the composition of matter has a homogeneous consistency.

29. The composition of matter of claim 27, wherein said at least one ethyl ester of a natural fatty acid is at least 50 % of said mixture by weight.

30. The composition of matter of claim 27, further comprising at least one additional ingredient.

31. The composition of matter of claim 30, wherein said at least one additional ingredient includes at least one flavoring agent.

32. The composition of matter of claim 30, wherein said at least one additional ingredient includes at least one odorant.

33. The composition of matter of claim 27, wherein said at least one solid fat is selected from a group of solid fats consisting of bee wax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, rendered animal fat and lanolin.

34. The composition of matter of claim 27, wherein said at least one solid fat is a synthetic polyester of fatty acids and a saccharide.

35. The composition of matter of claim 34, wherein said saccharide is selected from the group of saccharides consisting of sorbitol, glucose, fructose, lactose, mannose, ribose and deoxy-ribose.

36. The composition of matter of claim 34, wherein said at least one solid fat is a mixture of saccharide is sucrose and further wherein said fatty acid is selected from the group consisting of polypalmitate and polystearate.

37. A method of using at least one liquid oil for a purpose selected from the group consisting of nutritional supplementation, cosmetic treatment, use as a food additive, medical treatment, medical prophylaxis and cosmetic prophylaxis, the method comprising the step of using a composition of matter including a mixture of at least one liquid oil and at least one solid fat for accomplishing said purpose.

38. The method of claim 37, wherein the composition of matter has a homogeneous consistency.

39. The method of claim 37, wherein said at least one liquid oil is at least 50 % of said mixture by weight.

40. The method of claim 37, wherein said composition of matter further comprising at least one additional ingredient.

41. The method of claim 40, wherein said at least one additional ingredient includes at least one flavoring agent.

42. The method of claim 40, wherein said at least one additional ingredient includes at least one odorant.

43. The method of claim 37, wherein said at least one solid fat is selected from a group of solid fats consisting of bee wax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, rendered animal fat and lanolin.

44. The method of claim 37, wherein said at least one solid fat is a synthetic polyester of fatty acids and a saccharide.

45. The method of claim 44, wherein said saccharide is selected from said group of saccharides consisting of sorbitol, glucose, fructose, lactose, mannose, ribose and deoxy-ribose.

46. The method of claim 44, wherein said at least one solid fat is a mixture of saccharide is sucrose and further wherein said fatty acid is selected from said group consisting of polypalmitate and polystearate.

47. The method of claim 37, wherein said at least one liquid oil includes omega-3 polyunsaturated fatty acids.

48. The method of claim 37, wherein said at least one liquid oil includes α-tocopherol (vitamin E).

49. A method of using at least one liquid oil for prevention or treatment of a medical condition selected from the group consisting of cancer, hypertriglyceridemia, hypo HDL, high cholesterol, hyperinsulinemia and hyperglycemia, the method comprising the step of using a composition of matter including a mixture of at least one liquid oil and at least one solid fat for accomplishing said prevention or treatment.

50. The method of claim 49, wherein the composition of matter has a homogeneous consistency.

51. The method of claim 49, wherein said at least one liquid oil is at least 50 % of said mixture by weight.

52. The method of claim 49, wherein said composition of matter further comprising at least one additional ingredient.

53. The method of claim 52, wherein said at least one additional ingredient includes at least one flavoring agent.

54. The method of claim 52, wherein said at least one additional ingredient includes at least one odorant.

55. The method of claim 49, wherein said at least one solid fat is selected from a group of solid fats consisting of bee wax, propolis, butter, artificially hydrogenated vegetable oil, palm oil, cocoa butter, rendered animal fat and lanolin.

56. The method of claim 49, wherein said at least one solid fat is a synthetic polyester of fatty acids and a saccharide.

57. The method of claim 56, wherein said saccharide is selected from said group of saccharides consisting of sorbitol, glucose, fructose, lactose, mannose, ribose and deoxy-ribose.

58. The method of claim 56, wherein said at least one solid fat is a mixture of saccharide is sucrose and further wherein said fatty acid is selected from said group consisting of polypalmitate and polystearate.

59. The method of claim 49, wherein said at least one liquid oil includes omega-3 polyunsaturated fatty acids.

60. The method of claim 49, wherein said at least one liquid oil includes α–tocopherol (vitamin E).

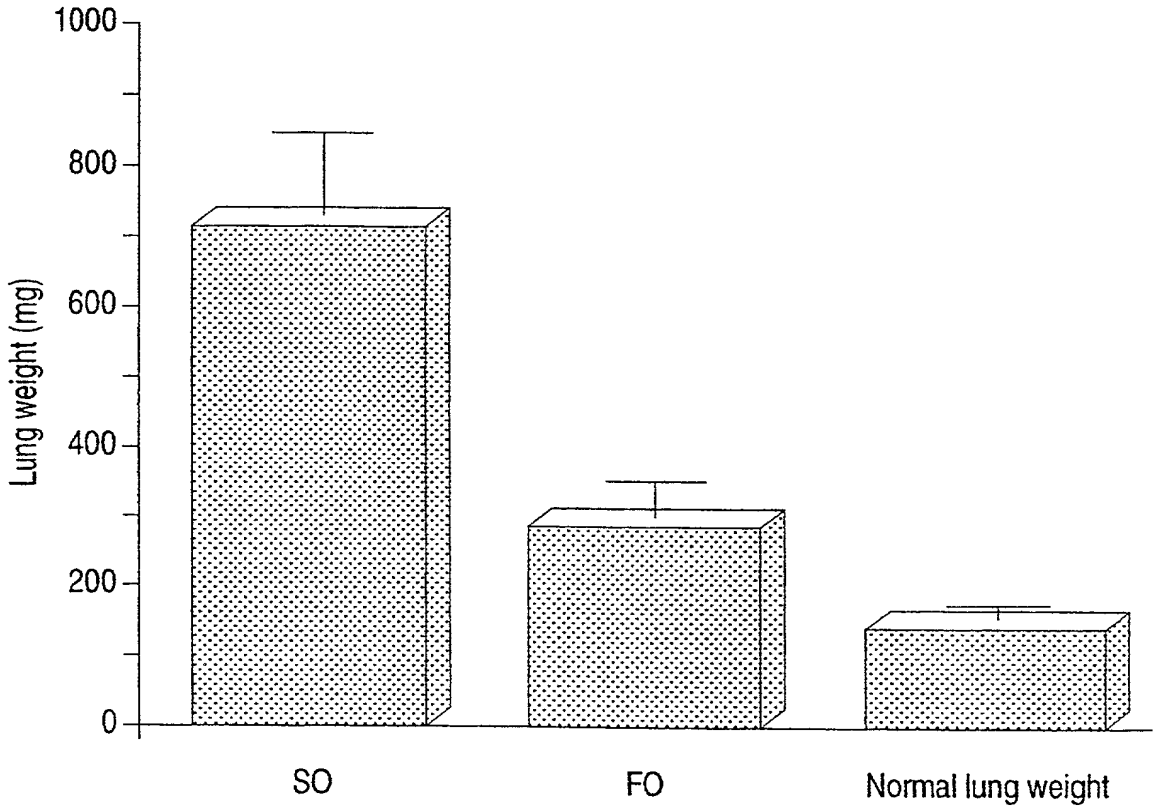

FIG.1. Mean + SD lung weight of mice after resection of primary growth and under SO or FO diet

Combined Declaration for Patent Application and Power of Attorney

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and that I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

PREPARATION AND USE OF SOLIDIFIED OILS

the specification of which (check one)

[ ] is attached hereto;

[ ] was filed in the United States under 35 U.S.C. §111 on _____, as U.S. Appln. No. _____*; or

[X] was/will be filed in the U.S. under 35 U.S.C. §371 by entry into the U.S. national stage of an international (PCT) application, PCT/_____; filed _____, entry requested on _____*; national stage application received U.S. Appln. No. _____*; §371/§102(e) date _____* (* if known)

and was amended on _____ (if applicable).

(include dates of amendments under PCT Art. 19 and 34 if PCT)

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above; and I acknowledge the duty to disclose to the Patent and Trademark Office (PTO) all information known by me to be material to patentability as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §§ 119 (a)-(d) and 365 (b) of any prior foreign application(s) for patent or inventor's certificate, or §365(a) of any prior PCT application(s) designating a country other than the U.S., listed below with the "Yes" box checked, and have also identified below, by checking the "No" box, any foreign application for patent or inventor's certificate or PCT international application having a filing date before that of the application on which priority is claimed:

126741	Israel	25 October 1998	[X] YES	[ ] NO
(Number)	(Country)	(Day Month Year Filed)		
_____	_____	_____	[ ] YES	[ ] NO
(Number)	(Country)	(Day Month Year Filed)		

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional applications listed below:

_____ (Application No)	_____ (Day Month Year Filed)
_____ (Application No.)	_____ (Day Month Year Filed)

I hereby claim the benefit under 35 U.S.C. §120 of any prior U.S. non-provisional application(s) or under §365(c) of any prior PCT international application(s) designating the U.S., listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in such U.S. or PCT international application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose to the PTO all information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (Application No.)	_____ (Day Month Year Filed)	_____ (Status: patented, pending, abandoned)
_____ (Application No.)	_____ (Day Month Year Filed)	_____ (Status: patented, pending, abandoned)

As a named inventor, I hereby appoint the following registered practitioners to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

All of the practitioners associated with Customer Number 001444

Direct all correspondence to the address associated with **Customer Number 001444**, which is presently:

BROWDY AND NEIMARK, P.L.L.C.
624 Ninth Street, N.W.
Washington, D.C. 20001-5303
(202) 628-5197

The undersigned hereby authorizes the U.S. Attorneys or Agents appointed herein to accept and follow instructions from Webb, Ben-Ami & Associates as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. Attorneys or Agents and the undersigned. In the event of a change of the persons from whom instructions may be taken, the U.S. Attorneys or Agents appointed herein will be so notified by the undersigned.

Atty. Docket: YAM 1

Title: PREPARATION AND USE OF SOLIDIFIED OILS

U.S. Application filed _____, Serial No. _____

PCT Application filed 25 October 1999 Serial No. PCT/IL99/00564

I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF FIRST INVENTOR	INVENTOR'S SIGNATURE	DATE
Daniel YAM	Daniel Yam	30/04/01
RESIDENCE		CITIZENSHIP
22/44 Hatikva Street, 75220 Rishon LeZion, Israel		IL
POST OFFICE ADDRESS		
22/44 Hatikva Street, 75220 Rishon LeZion, Israel DLX		
FULL NAME OF SECOND JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF THIRD JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF FOURTH JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF FIFTH JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF SIXTH JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF SEVENTH JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
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NO ALTERATIONS CAN BE MADE AFTER THE DECLARATION IS SIGNED ALL PAGES OF DECLARATION MUST BE SEEN BY ALL INVENTORS